

NOAA DIVING SAFETY BULLETIN #79-1

MEMORANDUM FOR: ALL NOAA DIVERS

FROM: J. Morgan Wells
NOAA Diving Coordinator

SUBJECT: 1. Unsafe Practice
2. Recommended Regulations Change
3. Recommended Regulations Change
4. Definition of a "Dive"
5. Recommended Regulations Change

THE NOAA DIVING SAFETY BOARD HAS DIRECTED THE NOAA DIVING COORDINATOR TO ISSUE "DIVING SAFETY BULLETINS" AT SUCH TIMES AS HE SHALL DEEM NECESSARY TO RAPIDLY ADVISE ALL NOAA DIVERS OF IMPORTANT MATTERS WHICH RELATE TO DIVING SAFETY. He shall also advise upon changes in operating policies and procedures, recommended by the Safety Board, in advance of formal Regulation changes, and shall promulgate changes in administrative policies and procedures when necessary.

1. UNSAFE PRACTICE

The NOAA Diving Regulations - Safety Rule #14c - require each diver to wear an "adequate inflatable vest or other flotation device" while diving. Variable-volume suits (such as Unisuits and Viking Suits) provide a diver with adequate flotation and a means of fine buoyancy control. However, the Safety Board has determined that, where power inflation and exhaust valves/controls for these suits are located upon the chest, the use of an additional front-mounted buoyancy compensator is an unsafe practice.

2. RECOMMENDED REGULATION CHANGE

The Safety Board has commenced efforts to develop NOAA guidelines and standards for "Exposure Suits and Compensating Systems". The results of these efforts will be an integral part of a recommended change to the Equipment Section of the NOAA Diving Safety Rules which will establish a new policy regarding variable volume suits.

For approval to use variable volume suits, any NOAA Diver must have:

- a. satisfactorily completed a minimum of three hours of training in the use of these suits

(two hours of which must have been in open water) from qualified persons designated by the NOAA Diving Coordinator; or equivalent prior experience verified by a qualified NOAA Unit Diving Officer.

- b. Demonstrated proficiency in use of such suits through a checkout dive with a qualified NOAA Unit Diving Officer or his designee.

3. RECOMMENDED REGULATIONS CHANGE

The Safety Board has recommended a change in operating procedures for the Scuba Diving Teams, Section 4(b)(2), as follows:

Scuba Diving Teams: Except under emergency conditions, the buddy System of at least two (2) divers will always be required. WHEN CONDITIONS ARE SUCH THAT THE PROBABILITY OF SEPARATION IS HIGH, SUCH AS LOW VISIBILITY, SOME FORM OF DIRECT CONTACT (PHYSICAL OR VISUAL) BETWEEN DIVERS SHALL BE MAINTAINED. TRAINEES WILL AT ALL TIMES BE WITHIN PHYSICAL OR VISUAL DISTANCE FROM OTHER QUALIFIED MEMBERS OF THE DIVE TEAM SUCH THAT ASSISTANCE MAY BE EASILY RENDERED IN THE EVENT THAT TROUBLE OCCURS. In the event that diving is shallow with a restricted area, with water conditions of low velocity and turbidity, the buddy diver may remain at the surface fully equipped, maintaining contact with the working diver at all times. A surface attendant shall be present in the immediate area any time diving conditions require it.

4. DEFINITION OF A "DIVE"

For purposes of the NOAA Diving Regulations and as a matter of official policy, the Safety Board has approved the following definition of a "Dive".

A dive is that time and activity spend on and beneath the Surface of the water by a person equipped with diving gear. A dive is completed when the diver (a) leaves the water, or (b) returns to the surface and then resubmerges to perform a different activity. During initial training, no more than one dive will be credited for each cylinder of air used.

5. RECOMMENDED REGULATIONS CHANGES

The Safety Board has recommended a new Diving Safety Rule which will be incorporated into the Regulations.

14j. Emergency Oxygen Resuscitator. An emergency oxygen resuscitator, capable of ventilating a non-breathing person, shall be at each dive site. Divers (and diver support personnel) shall be trained in the use of this equipment.

The requirement for oxygen resuscitators at each dive site has been a mandatory imposed by the Diving Coordinator in the past several months.

July 12, 1979

NOAA DIVING SAFETY BULLETIN #79-2

MEMORANDUM FOR: ALL NOAA DIVERS

FROM: J. Morgan Wells
NOAA Diving Coordinator

SUBJECT: Poseidon Regulator Hose Failure/Discontinued Use of
Poseidon Regulators

Several years ago we (NOAA) experienced at least three failures of hoses (dry suit inflator and breathing air) on Poseidon regulators.

The situation was believed to be rectified after all hoses were replaced on regulators with serial numbers specified by the supplier as being suspected of being defective. Two incidents within the past few weeks demonstrate that there is still a problem with these regulators which could result in serious accident. NOAA DIVERS ARE INSTRUCTED TO DISCONTINUE USE OF POSEIDON REGULATORS UNTIL FURTHER NOTICE.

Several Unit Diving Officers are working with NOAA Diving Office personnel in an attempt to rectify this situation in the shortest possible time. Contributions to this effort will be appreciated and should be addressed to the NOAA Diving Office.

It should be remembered that the loss of any of the hoses (dry suit inflator or octopus regulator) results in loss of air supply to the diver.

For those of you who may believe that discontinued use of these regulators is unnecessary, I offer the following convincing events for consideration.

1. From "The NOAA Diver" Vol. 2, Number 1, April 15, 1977

POTENTIAL EQUIPMENT PROBLEMS

The following is a excerpt of a memorandum received from NMFS diver Bob Shultz at Kodiak, Alaska, pointing out a potential problem with the Poseidon regulator:

"Recently during an environmental assessment of Wilson Arm, I experienced a very dangerous malfunction of my Poseidon regulator system. I was down about 45 feet when I hear a boom that sounded and felt like a small bore shotgun going off near my head. During this juncture, my regulator was blown from my mouth and I was forced to make a free ascent.

Apparently, what had happened was the pressed metal fitting which surrounds the air hose that fits over the fluting on the stem of the regulator had given way enough to allow the air pressure to cause ejection of the regulator from the hose. Since the regulator system had recently been inspected and reconditioned, this problem is probably attributable to an inherent weakness in the design of the system."

The Unit Diving Office at Auke Bay, Lou Barr, has noted that this may be a chronic problem as he has knowledge of a similar Poseidon failure prior to the one experienced by Schultz. It is strongly recommended that all hoses on the Poseidon should be carefully checked and the regulators used with an extra amount of caution.

As Lou Barr further notes, and we completely agree:

"This is an excellent example of the type of unforeseen emergency that can occur during an otherwise routine dive, and points out the need to have thoroughly trained and competent divers who can hand such emergencies."

2. From a November 22, 1977, memorandum from Tom McKinnon to Laboratory divers in Alaska.

At a depth of 85 ft it began with a loud ringing crack, then the sound of bubbles. The details of the Bob Schultz incident flashed in my mind and I instantly recognized my problem. My reflexes took over. I ditched my goody bag, tank and weight belt and started for the surface. The expanding air in my unisuit accelerated my ascent. I purged all air from my lungs around 60 ft and started to black out when I saw the surface from around 40 ft. I came to when I literally popped to the surface. During the last part of the ascent I grabbed the unisuit zipper and pulled it to release some of the air. The entire incident probably took less than 20 seconds, but had I delayed either by not immediately recognizing the predicament or by groping for straps or buckles, these details would probably be speculative or second-hand. I have since put my Poseidon regulator on the shelf and have advised all other Poseidon diehards to do the same. One incident is a freak, two is a tendency, and three is taking a big chance.

3. From an account of an incident occurring to Robert Budke in Alaska (July 1979)

I had just finished a dive and had made my exit onto a float when I hear air escaping. My partner checked my tank and regulator and found the inflator hose was loose and had slipped partway off the spigot fitting coming from the first state of my Poseidon regulator. In his attempt to push the hose back on it blew completely off.

I have been an active diver for many years and felt that my handling of diving equipment to be no better or worse than

most divers, so I don't feel we can attribute this incident to poor equipment handling.

4. From an account of an incident involving a trainee diver at Woods Hole, MA (July 1979)

At a depth of approximately 40 feet the "octopus" regulator blew off of the first stage with a "bang". The diver lost air to the regulator in her mouth. She immediately received air from her buddy's octopus and they ascended together.

NOAA DIVING SAFETY BULLETIN #79-3

MEMORANDUM FOR: ALL NOAA DIVERS

FROM: J. Morgan Wells
NOAA Diving Coordinator

SUBJECT: Poseidon Regulator Hose Failure/Replacement of
Poseidon Intermediate Breathing Hoses and Unisuit
Inflator Hoses

NOAA Diving Safety Bulletin #79-2 (July 12, 1979) instructed NOAA divers to "discontinue use of Poseidon regulators until further notice." This Bulletin includes instructions which will enable divers to identify potentially faulty hoses and to obtain replacement hoses.

The attached announcement from Parkway Fabricators includes diagrams of the "old" (potentially defective) and new (O.K.) hoses. The first state fitting is the key which will enable identification of the respective hoses. Note the space between the pressed metal fitting and the threaded fitting. The "new" hoses have a space of approximately 2 mm, while the two fittings on the "old" hoses meet. This means of identification applies to both intermediate breathing hoses and to Unisuit inflator hoses.

In December 1977 Parkway Fabricators announced the recall of Poseidon Cyklon 300 regulators with serial numbers 15024 through 16523 and 18050 through 18549 because of possible defect in the hose fittings. Unisuit inflator hoses were not recalled. NOAA divers have experienced failures of both types of hoses. At diving units where a number of these regulators are serviced, exchange of hoses is highly probable, therefore do not depend on serial numbers alone to identify potentially defective hoses. After potentially defective hoses have been replaced or existing hoses have been confirmed as being acceptable, you may resume use of Poseidon regulators.

Again it should be remembered that the loss of any of the hoses in question results in loss of air supply to the diver.

Two additional recommendations are appropriate here:

1. Pay attention to all recalls or announcements relating to defective, potentially defective, or unsafe equipment.
2. Initiate a means of alerting all NOAA divers of hazardous equipment or practices. The most effective means at present is through the NOAA Diving Office.

The new address and telephone numbers of the NOAA Diving Office are:

NOAA-NDO
6010 Executive Blvd
Rockville, MD 20852

FTS/ (301) 443-8007, 8008

Attachment

September 19, 1979

NOAA DIVING SAFETY BULLETIN #79-4

MEMORANDUM FOR: ALL NOAA DIVERS

FROM: J. Morgan Wells
NOAA Diving Coordinator

SUBJECT: 1. Recall of U.S. Divers Calypso "J" and Calypso VI
Regulators/Replacement and Repair of Regulators
2. Chest X-Rays - NOAA Medical Evaluation Criteria
(NOAA Form 64-5, Part I)

1. RECALL OF U.S. DIVERS CALYPSO "J" AND CALYPSO IV REGULATORS/
REPLACEMENT AND REPAIR OF REGULATORS

Communications with representative of U.S. Divers Co., Santa Anna, California has prompted the following statement:

"We have received a report of a malfunction of a calypso regulator in the field. After extensive testing by our engineering department, we were able to duplicate the malfunction. This malfunction could be possible in the first stage of our number 1083 and number 1084 Calypso regulators. At 1:00 pm September 13th, U.S. Divers has made the decision to perform a voluntary recall. This will authorize Aqua-Lung distributors and repair stations or U.S. Divers Company."

John J. Cronin
U.S. Divers
3323 W. Warner Avenue
Santa Anna, CA 92702

It is the understanding of the NOAA Diving Office that this malfunction will result in loss of air supply to the diver.

1. Pay attention to all recalls or announcements relating to defective, potentially defective, or unsafe equipment.
2. Initiate a means of alerting all NOAA divers of hazardous Equipment or practices. The most effective means at Present is through the NOAA Diving Office.

The address and telephones of the NOAA Diving Office are:

NOAA Diving Office - NDO
6010 Executive Boulevard
Rockville, MD 20852

Commercial and FTS / (301) 443-8007
443-8008
443-4132

2. Chest X-rays - NOAA Medical Evaluation Criteria (NOAA Form 64-5, Part I)

Review of the medical criteria for chest x-rays by the NOAA Diving Medical Review Board has resulted in the following consensus of opinion.

"Chest X-Rays: Since pressure related effects are mediated through the respiratory system, and lethal consequences may ensue, a 14 by 17 chest x-ray, PA and lateral, shall be taken as a baseline on the initial physical examination. The chest x-ray should be repeated every two years until the diver has reached the age of 40, then annually with each physical examination. This x-ray shall be reported as normal and the results included with the physical examination."

This change in evaluation policy should be brought to the attention of the examining physician with respect to the criteria for examinations. (NOAA Form 64-5, Part 1, X-Ray).

October 15, 1979

NOAA DIVING SAFETY BULLETIN #79-5

MEMORANDUM FOR: ALL NOAA DIVERS

FROM: J. Morgan Wells
NOAA Diving Coordinator

SUBJECT: Recall of Dacor Pacer Regulators and Repair of Regulators

Communication with representatives of the Dacor Corporation has prompted the following statement:

To All Dacor PACER Regulator Owners

Dacor Corporation has announced a voluntary Recall of all PACER regulators and second Stages shipped from the factory prior to July 31, 1979. A flaw which occurred during Fabrication has been discovered in the top Cover of the second state and can cause free Flow. All PACER owners who suspect they have A faulty unit, should not dive with the Regulator and should take it to their nearest Dacor dealer for free repair. Because of a Design modification, PACER regulators shipped after August 1, 1979, are not involved in this recall.

The following attachments outline in detail to the Dacor dealer the details of repair pertaining to the recall of the PACER regulators, and instructions for cover assembly.

It is the feeling of the NOAA Diving Office that the preceding repair directions be carried out by an authorized Dacor Dealer or an authorized repair facility.

Attachment

January 13, 1981

NOAA DIVING SAFETY BULLETIN #81-1

MEMORANDUM FOR: ALL NOAA DIVERS

FROM: J. Morgan Wells
NOAA Diving Coordinator

SUBJECT: 1. New Address for Diving Office
2. New Regulations on Chest X-Ray
3. New Regulations on EKG

1. New Address and Phone Number for NOAA Diving Office:

NOAA Diving Office - OA/C74	FTS/301-443-8007
National Ocean Survey	FTS/301-443-4132
Rockville, Maryland 20852	

2. Chest X-rays - NOAA Medical Evaluation Criteria (NOAA Form 64-5, Part I)

Review of the medical criteria for chest x-rays by the NOAA Diving Medical Review Board has resulted in the following consensus of opinion.

"Chest X-rays: Since pressure related effects are mediated through the respiratory system, and lethal consequences may ensue, a 14 x 17 chest x-ray, PA and lateral, shall be taken as a baseline on the initial physical examination. The chest x-ray should be repeated every two years until the diver has reached the age of 40, then annually with each physical examination. This x-ray shall be reported as normal and the results included with the physical examination."

This change in evaluation policy should be brought to the attention of the examining physician with respect to the criteria for examinations. (NOAA Form 64-5, Part 1, X-ray).

3. EKG - NOAA Medical Evaluation Criteria (NOAA Form 64-5, Part 1)

EKG: A baseline normal resting 12 lead electrocardiogram shall be performed on the initial examination. The electrocardiogram shall be repeated annually after the age of 35.

This change in evaluation policy should be brought to the attention of the examining physician with respect to the criteria for examinations. (NOAA Form 64-5, Part 1, EKG).

April 9, 1981

NOAA DIVING SAFETY BULLETIN #81-2

MEMORANDUM FOR: ALL NOAA DIVERS

FROM: J. Morgan Wells
NOAA Diving Coordinator

SUBJECT: 1. Use of Adapters
2. First Stage Regulator "Freeze-Up"
3. Harness/Straps and Inflation
Devices on Dry Suits
4. Teflon Washers in Hose Adapters
5. Dry Suit Neck Seals, Suit Flooding,
and Buoyancy Loss

1. Use of Adapters, "T's", or Other Multiple-Outlet Swivels, etc., In Intermediate Pressure Portions of Underwater Breathing Apparatus.
Caution must be used when adding adapters, "T's", or other multiple-outlet swivels to the intermediate pressure portion of UBA which supplies breathing gas to the divers; such as adapters can reduce the gas available during diver inhalation. Such reduction in gas flow may not be apparent at the surface, but can become significant at depth. Recent NOAA Diving Office test indicate that the reduction in gas flow is caused by small diameter of the orifice in adapters which are used to mate UBA components of U.S. and European manufacture, and adapters to add suit-inflation hoses to the intermediate pressure hoses of UBA.

All diving apparatus which includes the components mentioned above should be examined to insure that the inside diameters of adapters and T's through which breathing gas flows are at least as large as the original diameters of the standard fittings on the apparatus. Fittings with inappropriate sealing

surfaces may have matching threads. The use of U.S.-Metric adapters intended for the use of Unisuit inflator hoses on U.S. regulators must not be used to adapt AGA intermediate pressure hoses to U.S. regulators. The threads match, and the use of a Teflon washer (instead of the recessed "O" ring, which cannot be used due to orientation of sealing surface) may provide a seal, but flow is drastically reduced and blowout may occur.

2. First Stage Regulator "Freeze-Up"

During recent NOAA Diving Office tests at 42 degrees F, a "freeze-up" occurred with an AGA Divator UBA. This incident occurred immediately after the diver disconnected the surface supplied air and began using air from a self-contained high pressure source. We believe that this problem was caused by a small quantity of fresh water which entered from the UBA first stage from the umbilical and froze up due to the cooling which accompanied the expansion of the high pressure air. "Freeze-up" caused by water inside UBA can occur at relatively high temperatures. Great care should be exercised to prevent water from entering the gas supply side of UBA.

3. Harness/Straps and Inflation Devices on Dry Suits

NOAA Diving Safety Bulletin #79-1 stated that "where power inflation and exhaust valves/controls for these suits (dry) are located upon the chest, the use of an additional front-mounted buoyancy compensator is an unsafe practice."

Part of the rationale for this statement was based on the accidental, uncontrolled inflation of a dry suit caused by the inability of a diver to remove his hand from between the B.C. and inflation valve following the addition of air to the suit. An accidental blowup resulted from this action.

During recent NOAA Diving Office tests, and unintentional/uncontrolled inflation of a Viking Suit was caused by a diver harness crossing over the inflation valve.

Diving harnesses and other straps must be positioned such that unintentional inflation or deflation of dry suits is not possible.

4. Teflon Washers in Hose Adapters

Teflon washers are commonly found in adapters which convert metric (European) to U.S. manufactured parts in UBA and suit inflators. Overtightening of such fittings can result in excessive flattening of the teflon washers and reduction in the effective diameter of the gas flow path to the point of significant breathing resistance or slow suit inflation. Reduced gas flow may not be apparent at the surface but can be significant at depth or during strenuous activity.

5. DrySuit Neck Seals, Suit Flooding, and Buoyancy Loss

NOAA Diving Safety Bulletin #79-1 contained a revision in the Safety Rule #14c of the Diving Regulations related to the use of buoyancy compensators with dry suits. The following statement was included, "Variable-volume suits (such as Unisuits and Viking suits) provide a diver with adequate flotation and a means of fine buoyancy control."

This statement requires some qualification. If neck seals (dams) are defective, installed in such a fashion that gas can easily pass into the hood, too large, or absent, gas can be easily lost from the hood, resulting in significant loss of buoyancy.

Safety Bulletin #79-1 also states, "The Safety Board has determined that, where power inflation and exhaust valves/controls for these suits are located upon the chest, the use of an additional front-mounted buoyancy compensator is an unsafe practice."

Both of the above statements remain correct. What must be emphasized is that any neck seals (dams) which readily allow gas to move from the suit into the hood constitutes a safety hazard, because the suit will not provide the SCUBA diver with adequate flotation.

This means that if a good neck seal can be reasonably assured, no additional buoyancy compensation device is required. If, however, the neck seal cannot be reasonably assured, an additional buoyancy compensating device must be used but the BC must NOT

interfere with access to nor operation of the gas valves on the suit.

Great care must be exercised during training programs where, rather than custom fitted suits, inexperienced divers share suits.

March 28, 1983

NOAA DIVING SAFETY BULLETIN #83-1

MEMORANDUM FOR: ALL NOAA DIVERS

FROM: J. Morgan Wells
NOAA Diving Coordinator

SUBJECT: Product Recall - Royal Aqua Lung
(Model #1014) & Royal Octopus
(Model #1091)

PRODUCT RECALL

U.S.D. CORP. (formerly U.S. Divers Co.), Santa Ana, CA., announced the voluntary recall of all Royal Aqua-Lung (Model #1014) and Royal Octopus (Model #1091) regulators. The Royal regulators have been marketed nation-wide since December, 1982.

The recalled regulators may have a potential problem which could result in a shutdown of air. It is possible that a plastic clip in the demand lever assembly of the second stage of the Royal regulators may become dislodged. The plastic clip could then prevent the proper operation of the demand lever, and this could eliminate the flow of air. If this occurs, use of the regulator could be hazardous.

The model name of the Royal regulators appears on the decal located on the face of the second stage of the regulator. Only Royal regulators are being recalled.

Consumers are warned not to dive with these regulators until they have been factory serviced. The consumer should return the regulators directly to U.S.D. Corporation by shipping the regulators to: U.S.D. Corp, Attn: Royal Recall-Factory Service, 3323 W. Warner Avenue, Santa Ana, CA 92702.

U.S.D. Corp will pay for all shipping costs. Consumers should include their name, address, and telephone number, and the name of the dealer from which the regulator was purchased, when shipping the regulators. The consumer may also return the regulator to any authorized Aqua-Lung Pro-Line dealer.

Consumers requiring additional information should contact U.S.D. Corp, Customer Service Department, 3323 W. Warner Avenue, Santa Ana, CA. 92702, or telephone collect the Customer Service Department at 714/540-8010.

October 1, 1984

NOAA DIVING SAFETY BULLETIN #84-1

MEMORANDUM FOR: ALL NOAA DIVERS

FROM: J. Morgan Wells
NOAA Diving Coordinator

SUBJECT: High Pressure Air Systems

At the last meeting of the NOAA Diving Safety Board, the subject of High Pressure Air Systems was discussed in depth. A number of incidents, poor procedures, and unsafe situations were brought to the attention of the Safety Board. These circumstances have resulted in the overfilling of steel and aluminum scuba tanks, and have also resulted in various parts and fittings of filling systems being overpressurized.

These situations are dangerous and could be the cause of a serious or even fatal injury.

To reduce the possibilities of a tank rupturing or a system failure, the NOAA Diving Safety Board has designated the following policies for the use of HP Air Systems. Each policy is effective immediately!

1. The maximum working pressure for all HP systems within the NOAA Diving Program, and to be used by NOAA Divers, is 3200 psi.
2. If a permanent filling system is capable of delivering 2500 psi or higher, then equipment must be installed to ensure that steel tanks cannot be over filled. The equipment will consist of a 3-way valve and a pressure reduction regulator. The 3-way valve will be clearly marked to indicate the proper position for

filling steel or aluminum tanks. Any unit having a system that is capable of delivering 2500 psi or more should contact Richard Rutkowski, FTS 350-1223, or commercial (305) 361-4223 for information and direction on upgrading their systems to ensure compliance with this Safety Bulletin.

3. All existing HP systems that are capable of pressures of 2500 psi or more must be inspected by Richard Rutkowski, or his designee, to ensure that all fittings, valves, lines, hoses, filters, and storage flasks meet the specifications for the pressures being used within the system.

Any questions concerning the policies should be directed to Richard Rutkowski.

December 20, 1984

NOAA DIVING SAFETY BULLETIN #84-2

MEMORANDUM FOR: ALL NOAA DIVERS

FROM: J. Morgan Wells, N/MO15
NOAA Diving Coordinator

SUBJECT: Equipment Maintenance

Recent reports of hazardous incidents and/or equipment in hazardous condition have been brought to my attention. The reports cover a multitude of equipment problems. I am particularly concerned with the reports that involve intermediate regulator hoses and high pressure (H.P.) hoses on submersible pressure gauges. Each Unit Diving Supervisor (UDS), Divemaster, and diver is reminded that it is their responsibility, as stated in the NOAA Diving Regulations, to properly maintain their diving equipment. I interpret this to include required annual maintenance, day-to-day upkeep and the replacement of equipment that has outlived its useful life. UDS's and Divemasters should particularly note their responsibilities to insure that the proper equipment maintenance records are maintained.

The following incidents have recently been reported:

1. A NOAA Diver's intermediate hose separated from the ferrule, on the first-stage end, during a 20 foot working dive. The immediate loss of air forced the diver to perform a free ascent.
2. The intermediate pressure hose of a NOAA diver's regulator ruptured on deck while he was waiting to enter the water.

3. The intermediate pressure hose of a NOAA diver's regulator ruptured when he turned on the air cylinder.
4. In a non-NOAA incident the HP hose on a submersible pressure gauge ruptured as the diver turned on the air cylinder. The ruptured hose whipped upward striking the diver across the eye. The resulting injury caused the diver to lose 90% of his vision in one eye.
5. During an inspection of the equipment brought to recent basic class, three out of ten regulators were found to have bulges, cracks, or total separation of the braided hose from the connecting ferrule. One regulator had a BC hose and an intermediate hose that were in a deteriorated state. One hose that was inspected was found to be held together with electrical tape and wire ties. The instructors also found fins that were totally rotted and suits that were improperly fitted to the point of creating a hazardous situation.

In order to insure the safety and efficiency of our Diving Program, each diver should make an extra effort to assure the proper use and maintenance of his/her equipment.

When checking your gear before each dive, inspect the hoses before pressurizing them, and again after pressurization. If there are any bulges, nicks, or stressed points, the hose should be replaced immediately. Remember, that hidden hose deterioration can occur under your hose protector. Also, a number of the incidents that have occurred involved new hoses. The age of the hose does not necessarily preclude possible defects or damage.

Unit Diving Supervisors must insure that equipment sent with trainees to diver training programs is in proper working condition and of appropriate size.

Due to the rather high incidence of hose failures in recent years, the NOAA Diving Program has initiated a study relating to the "Burst Pressure and Breaking

Strength of Regulator Hoses (H.P. and L.P.). You are encouraged to assist in this effort by providing us with any hoses that must be removed from service. A brief history of the hose (age, nature of failure, or reason for replacement, etc.) would be of benefit.

Tagged hoses should be sent to:

Cliff Newell
Unit Diving Supervisor
Northeast Fisheries Center
NOAA-NMFS
Woods Hole, Massachusetts 02543

March 20, 1986

NOAA DIVING SAFETY BULLETIN #86-1

MEMORANDUM FOR: ALL NOAA DIVERS

FROM: J. Morgan Wells
NOAA Diving Coordinator

SUBJECT: 1. Submersible Pressure Gauge Failure
2. Poseidon Regulator Hose Failures
3. SPG Test Gauges
4. Variable Volume Dry Suit Sizes

SUBMERSIBLE PRESSURE GAUGE FAILURE

During a recent training class, a submersible pressure gauge (SPG) failed, forcing a student into a buddy breathing ascent. Prior to the dive, the gauge was working correctly, but had a screw loose inside the dial. This seemingly innocuous piece of hardware jammed the needle at 1600 psi. (see fig. 1) and, as a result, the diver breathed his tank empty (without knowing it. It speaks well for the student and that he was able to handle this "real world" emergency, and for his buddy, who was nearby and prepared to help out as he should have been.

The incident would have been avoided completely if an attentive inspector had removed the equipment from service. All personnel involved in a diving operation must learn to be aware of what's going on and not to use questionable equipment.

POSEIDON REGULATOR HOSE FAILURES

A student in a recent class arrived equipped with a "new" Poseidon regulator. Inspection of the hose by the class instructors revealed that the hose was of a defective design that had been recalled in 1979. In addition, the hose was already pulled part way off the fitting.

Fortunately this defective hose was caught before any problems developed. The diver had recently purchased the regulator and had no idea that there could be a problem. It is possible that, although the regulator was new, a hose had been installed from stock that was from the defective issue of hoses.

NOAA Diving Safety Bulletin 79-2 and 79-3 addressed regulator and dry-suit inflator hose failures on Poseidon regulators. Bulletin 79-3 specifically addressed how to recognize the defective issue hoses. All NOAA divers are directed to review these bulletins and inspect any Poseidon hoses that may be received from dive shops. Although most shops have disposed of any defective hoses, there are obviously a few still out there.

SPG TEST GAUGES

The NDP Diving Equipment Worker, Steve Urick, is preparing Submersible Pressure Gauge (SPG) Testers to be distributed throughout the program. Since SPG failure can cause serious diving accidents, it has been determined that the need exists to require each divemaster to test the SPG's in his charge on a regular basis. Procedures will be included with the units and Steve plans to have the testers shipped by the end of March. An illustration of a SPG tester is included as figure 2.

VARIABLE VOLUME DRY SUIT SIZES

The last few years have show a shift to Variable Volume Dry Suits as the standard diving suit used by NOAA Divers outside of tropical waters. This has resulted in a much wider assortment of people being trained in the use of dry suits and using them in the field. A problem that is being addressed by the NDP at this time is providing properly sized dry suits for small divers. A final resolution has not been found, but the following reminder is important. The variable volume dry suit need to fit the diver reasonably well in order for that diver to perform his/her task safely. Safety is the operative word in this warning! The NOAA Diving Regulations require that both divers and divemasters ensure that the equipment and operation are safe. In other words, don't dive in a suit that fits so poorly as to endanger your ability to control that suit!

Unit Diving Supervisors are directed to ensure that each NOAA diver in their unit is given access to this bulletin. Any information that has an impact upon the safety of NOAA divers should be brought to the attention of the NOAA Diving Coordinator by the fastest means.

NOAA Diving Program N/MO15
National Ocean Service, Office of Marine Operations
6001 Executive Blvd., Rm 304
Rockville, Maryland 20851

Commercial phone: (301) 443-8007
FTS: 443-8007

April 30, 1986

NOAA DIVING SAFETY BULLETIN #86-2

MEMORANDUM FOR: ALL NOAA DIVERS

FROM: J. Morgan Wells
NOAA Diving Coordinator

SUBJECT: Testing of Submersible Pressure Gauges

TESTING OF SUBMERSIBLE PRESSURE GAUGES

Submersible Pressure Gauges (SPGs) are important enough as safety equipment to require that their accuracy be tested on a regular basis. To this end, the NOAA Diving Program (NDP) is distributing Submersible Pressure Gauge Testers (PGT) to all units.

All SPGs in use will be tested under the following circumstances:

- Annually (at the minimum)
- Any time the SPG's accuracy is suspect
- After and SPG has been repaired
- Prior to using a new SPG
- After anSPG has been exposed to unusual shock
- Any time there is a diving incident, all SPGs involved shall be tested and the results included in the UDS's report.

SPGs should be tested before major diving operations and before units leave for the field season.

All SPGs will be tested at NDP classes, both to ensure safe equipment for the class, and to train the students in the use of the PGTs.

Defective SPGs must be repaired and retested, or replaced. The NDP requests that any SPGs that are beyond repair be sent to this office for study.

Any question concerning the procedure for using PGT's should be addressed to Steve Urick, Diving Equipment Specialist, NDP (FTS 443-8007). Call him if there are any questions about a PGT's accuracy and arrangements can be made for a calibration or trade.

Unit Diving Supervisors are directed to ensure that each NOAA diver in their unit is given access to this bulletin. Any information that has an impact upon the safety of NOAA divers should be brought to the attention of the NOAA Diving Coordinator by the fastest possible means.

NOAA Diving Program - N/MO15
Office of Marine Operations, NOS
6001 Executive Blvd., Rm. 304
Rockville, Maryland 20851

Commercial Phone: (301) 443-8007
FTS: 443-8007

August 4, 1986

NOAA DIVING SAFETY BULLETIN #86-3

MEMORANDUM FOR: ALL NOAA DIVERS

FROM: J. Morgan Wells
NOAA Diving Coordinator

SUBJECT: 1) New Chest X-Ray Requirements
2) Compressor Filter Systems

CHEST X-RAY REQUIREMENTS

Based on the recommendations of the NOAA Diving Medical Review Board (NDMRB), NOAA Directive 64-3, Exhibit No. 2A shall be revised as follows:

46. Chest X-ray - Since pressure related effects are mediated through the respiratory system, and lethal consequences may ensue, a report of a 14 x 17 in. chest x-ray, PA and lateral, shall be taken:

- 1) as a baseline on the initial physical examination.
- 2) every 2 years after the age of 40.
- 3) whenever indicated by medical history or clinical findings.

This change eliminates the requirement for a semi-annual check x-ray before the age of 40 and reduces the post age 40 check x-ray requirement from annual to semi-annual. Chest x-rays may still be required by an examining physician or NDMRB whenever indicated by medical history or clinical findings.

A revised physical examination checklist is attached.

COMPRESSOR FILTER SYSTEMS

Several filter canisters from NOAA High Pressure (HP) air compressors were discovered to be corroded and pitted to the extent that their integrity was jeopardized. This could lead to compressor failure or canister explosion.

All compressor canisters shall be inspected by a NOAA qualified Cylinder Inspector on a yearly basis following Visual Cylinder Inspection (VCI) program procedures for HP cylinders. The results of these inspections shall be logged in the compressor log.

Questions concerning the canister procedure or the VCI program in general should be addressed to LT Ed Clark, NDP VCI Program Coordinator, Seattle, Washington, FTS 392-6196.

Attachment

November 21, 1986

NOAA DIVING SAFETY BULLETIN #86-4

MEMORANDUM FOR: ALL NOAA DIVERS

FROM: J. Morgan Wells, N/MO15
NOAA Diving Coordinator

SUBJECT: AGA Mask Hose Failure

AGA MASK HOSE FAILURE

Some older model AGA Full Face Mask supply hoses are subject to failure and should be removed from service immediately.

Models of the SPP-01 hose for the SPM-01 mask sold prior to 1983 have a faulty crimp fitting which may rupture after prolonged use. EFCOM, INC. will replace these hoses with new ones.

The attached drawing illustrates the difference between the "old" and "new" hoses. Also, the "new" hoses are marked "Pressure-Tested".

This situation was brought to the NOAA Diving Program's attention by a potentially hazardous hose failure in the Northwest and Alaska Fisheries Center, Pasco, Washington.

Questions regarding this matter may be addressed to:

Mr. Bruce O'Bannon
EFCOM, INC.
1336 E. Wilshire Ave.
Santa Ana, CA 92705
(714) 543-0677

March 20, 1987

NOAA DIVING SAFETY BULLETIN 87-1

MEMORANDUM FOR: ALL NOAA DIVERS

FROM: J. Morgan Wells
NOAA Diving Coordinator

SUBJECT: NOAA Diving Safety Bulletin 87-1

DIVING ACCIDENT REPORT

During a recent Operational Diving Class a student suffered Decompression Sickness (Type II) during a routine chamber orientation dive. Sixteen divers were pressurized to 125 FSW for a :08 bottom time, and decompressed on the U.S. Navy Standard Air Decompression Table 130'/:15 with a :01 decompression stop at 10 feet.

This was the first dive of the day for all divers, and they were pressurized to 125 FSW in groups of four, only one student experienced a decompression problem.

The onset of symptoms was :10 post dive but were not reported to the diving supervisor until 1 hr. post dive. The student reported the he was feeling pain and fatigue in his right leg and hip. He stated the symptoms went away with exercise but recurred while in the sitting position on the floor.

The student was examined at the NOAA Diving Facility and found to have decreased pin-point discrimination in the dorsal aspect of the right thigh and lateral aspect of the right lower leg.

The student was transported to Virginia Mason Hospital Hyperbaric Facility, he was treated on a U.S. Navy Treatment Table 6, with extensions at both 60' and 30'. The student was asymptomatic upon completion of the hyperbaric treatment, examined by a Diving Medical Officer and give post treatment instructions.

The orientation dive was routine procedure, well within the limits of the decompression table, none of the other students were affected.

Note: Report any an all signs or symptoms to the Diving Supervisor promptly after being under pressure.

October 19, 1987

NOAA DIVING SAFETY BULLETIN 87-2

MEMORANDUM FOR: ALL NOAA DIVERS

FROM: N/MO15 - J. Morgan Wells
NOAA Diving Coordinator

SUBJECT: 1) Retrofit of Plastic Dip Tubes with
Brass Dip Tubes in Scubapro Tank
Valves
2) Faulty High Pressure (H.P.) Valve
Seat

The following is quoted from SCUBAPRO Engineering Bulletin #181:

"In response to a request from the U.S. Department of Transportation (D.O.T.), Scubapro has discontinued the use of all plastic dip tubes (P/N 14-157-106) in all applications. It has been suggested by the D.O.T. that in the event that a charged cylinder is exposed to fire, a plastic dip tube could melt or deform, and possibly prevent effective release of air through the pressure relief valve (burst disc).

The affected valves are the standard valve, P/N 14-059-000, 14-070-000 and double tank manifold 14-002-000 and 14-003-000. The Scubapro H.P. and D.C.A.R. are not affected as they have always had brass dip tubes. These valves can be identified by the high pressure stem gauge in the back of the valve. Their P/N's are 14-072-000, 14-151-000, 14-152-000 and 14-071-000.

The new replacement brass dip tubes (P/N 14-157-108) are in stock and available now. We are requesting that you replace any plastic dip tubes with new style brass tubes during the next service or visual inspection. New brass tubes are provided free of charge on an exchange basis."

All plastic dip tubes on NOAA tank valves should be replaced as soon as possible.

FAULTY HIGH PRESSURE (H.P.) VALVE SEAT

The Navy reports that nylon valve seats (Part no. 2302) installed in the Poseidon Cyklon 300 SCUBA Regulator will freeflow when pressurized. A new improved Teflon H.P. seat (PN 2302 Teflon) has been developed to replace the defective seat. All Nylon H.P. seat should be replaced to ensure safe operation of the regulator. Visual inspection can verify nylon (colored white) vice Teflon (colored yellowish brown) H.P. Valve seat.

Viking American Inc. distributors for Poseidon regulators is conducting a no cost one-for-one replacement of the nylon seats for the Teflon H.P. seats. For details, contact Viking America:

Viking American, Inc.
55 Old South Avenue
Stratford, CT 06497
(203) 377-6974

October 19, 1987

NOAA DIVING SAFETY BULLETIN 87-3

MEMORANDUM FOR: ALL NOAA DIVERS

FROM: N/MO15 - J. Morgan Wells
NOAA Diving Coordinator

SUBJECT: Instructions for Field Replacement of
V203 Retaining Ring on DUI Exhaust
Valves

We have been informed by the manufacturer that some of the outer rings, part number B0203, have to be replaced. Some of the rings which hold the top of the valve in place were made from an incorrect plastic material which may absorb water and change the dimension of the ring.

However, there is no visual difference between the plastics to make for easy identification. Therefore, they recommend all rings be placed to be safe.

The attached directions and drawings explains the procedure, any questions concerning this field change can be addressed to Lt. Ed Clark, and replacement retaining rings can be obtained from him.

Point of Contact:

LT Ed Clark
NOAA Diving Program
7600 Sand Point Way, NE
BIN C15700
Seattle, WA 98115-0070

FTS - 392-6196
Commercial - (206) 526-6196

June 9, 1988

NOAA DIVING SAFETY BULLETIN 88-1

MEMORANDUM FOR: ALL NOAA DIVERS

FROM: N/MO15 - J. Morgan Wells
NOAA Diving Coordinator

SUBJECT: Recall Bulletin Concerning Scubapro
Heat-Sealed Type Stabilizing Jackets
and Front Adjustable Buoyancy Devices

The NOAA Diving Program Office has been notified of a potential problem with the overpressure/dump valve on the Heat-Sealed Type Scubapro Buoyancy Devices.

Scubapro is voluntarily recalling all of its Heat-Sealed Type Buoyancy Devices manufactured prior to April 28, 1988.

All NOAA divers will suspend the use of this buoyancy device until the valve has been replaced by Scubapro or an authorized Scubapro dealer, and the valve has been tested.

The attached information concerning the recall procedures should be followed to ensure the proper repair of this buoyancy device.

NOAA Diving Program Point of Contact:

Chet Stanley - Diving Training Instructor
NOAA Diving Program Headquarters
WSC-1 Rm. 304, 6001 Exec. Blvd.
Rockville, Maryland 20852
FTS 443-8007 Commercial (301) 443-8007

Attachment

September 20, 1988

MEMORANDUM FOR: N/MO15 – J. Morgan Wells

FROM: Leonard Bachman, MD
Chairman, NOAA Diving Medical Review Board

SUBJECT: NOAA Diving Physical Readiness Testing Program

I strongly recommend that the Physical Readiness Testing (PRT) Program attached as NOAA Diving Safety Bulletin 89-1 be implemented as soon as possible.

I am temporarily implementing the percent body fat standard as a secondary body composition standard to be used when the height/weight tables are determined to be inappropriate. This will remain in effect until the full PRT program is implemented. At that time the medical standard for body composition will be the percent body fat as calculated using the worksheet in Safety Bulletin 89-1.

I wish to emphasize that the PRT requirements are a minimal standard which should be readily obtainable by all NOAA divers without difficulty. I encourage NOAA divers to strive for a higher than “satisfactory” levels.

Cc: All NOAA Divers

attachment

September 20, 1988

NOAA Diving Safety Bulletin 89-1

MEMORANDUM FOR: All NOAA DIVERS

FROM: J. Morgan Wells
NOAA Diving Coordinator

SUBJECT: NOAA Diving Physical Readiness Testing Program

PURPOSE

This safety bulletin revises standards for the physical fitness of NOAA divers. These standards will help the Unit Diving Supervisors (UDSs) ensure that all NOAA Divers are minimally physically fit to dive safely. I expect that this encouragement to maintain a regular exercise program will improve the general health and quality of life for our divers as well.

AUTHORITY

This bulletin constitutes a change to the NOAA Diving Medical Standards by replacing the Height/Weight Table in the NOAA Diving Medical Evaluation Criteria (NOAA Directive 64-23; NOAA Diving Regulations; Exhibit No. 2a). This policy is implemented upon the recommendation of the NOAA Diving Medical Review Board, with the concurrence of the NOAA Diving Safety Board, under the authority granted them in the NOAA Diving Regulations.

BACKGROUND

Operational diving requires divers to perform rigorous aerobic and anaerobic exercise. Previous policy did not give the UDS, NOAA Diving Coordinator or an examining physician any yardstick against which to measure an individual's fitness. Implementation of a Physical Readiness Testing (PRT) program will allow screening of diver candidates prior to investing time and money in diving training, and will allow UDSs to ensure that current NOAA divers are maintaining themselves in good physical condition as required by regulation.

Because of the high solubility of nitrogen in fat and because of the poor vascularity of fatty tissue, it has long been held that obesity increases susceptibility to decompression sickness. Being overfat indicates poor general cardiovascular fitness and ability to perform strenuous work. The medical standard for overfat is a percent body fat of 22% or greater for men and 33% or greater for women.

Previous use of the standard height/weight tables have shown that they are at best a tool for general screening. Many body types do not fit into the tables, yet have acceptable body fat levels, while some divers that fit the tables have an excessively high percent body fat. The most accurate method of determining body composition is direct measurement of body density in a weighing tank. However, this method is not available to all NOAA divers, and so a more “portable” method is necessary. The attached measurement method is from U.S. Navy OPNAVINST 6110.1C and is performable with only a tape measure. This method produces results that correlate very closely to those from the weighing tank. This correlation has been validated by experimentation by the NOAA Fleet Medical Officers.

The exercise portion of the PRT is also derived from the U.S. Navy’s OPNAVINST 6110.1C, which is the Navy wide PRT program, and the PRT test used by the NOAA Commissioned Corps. These programs are used to ensure basic physical fitness for all ratings and professions throughout the Navy and NOAA Corps.

IMPLEMENTATION

UDSs will distribute this bulleting to all active NOAA divers upon receipt. All divers not already doing so, should embark upon a regular exercise program to ensure their readiness to participate in the PRT when scheduled.

BODY COMPOSITION SCREENING

EXAMINATION REQUIREMENTS

INITIAL: The UDSs will ensure that the initial Body Fat Computation Worksheet (attachment 2) is completed prior to the administration of the PRT, and forwarded to NDP with the PRT results. A copy should be retained in the diver’s record at the diving unit.

ANNUAL: The Body Fat Computation Worksheet will be completed coincident with the diver’s annual physical examination. The worksheets will be forwarded to NDP Headquarters with a copy retained in the diver’s record at the diving unit.

DIVER CANDIDATES: The Body Fat Computation Worksheet will be completed coincident with the divers’ initial diving physical examination. Obese and overfat personnel will not be processed for certification or training.

NOAA COMMISSIONED OFFICERS: Body Composition Measurements conducted to satisfy NOAA Corps regulation will suffice to meet the requirements of this Safety Bulletin if they are performed reasonably coincident with the divers annual physical. The UDS will determine “reasonable coincidence”.

PROCEDURE

The UDS or his designee shall take body measurements to determine each diver’s body composition. Detailed instructions on the method of calculating percent body fat are included in attachment 1.

Divers that are classified as overfat or obese (male: 22% or greater, Female: 33% or greater) will be considered medically unfit for diving. Their authorization to dive for NOAA will be suspended, and they will be placed in “inactive” status, effective immediately. Overfat and obese personnel will not be allowed to take the PRT.

PHYSICAL READINESS TESTING PROGRAM

TESTING REQUIREMENT

INITIAL: The UDSs shall ensure that all NOAA divers complete, and pass, the PRT within one year of the date of this bulletin.

ANNUAL: All NOAA divers will pass the PRT each calendar year, and at any time that the UDS determines that a diver’s physical condition is suspect.

DIVER CANDIDATES: Diver Candidates will be required to take and pass the PRT prior to admission to a NOAA Diving class. Documentation of successful completion of the PRT must be forwarded to NDP headquarters prior to the application cutoff date for that class. (NOTE: PRT testing will only be conducted after the candidates have completed their diving physical and been approved for diving by the examining physician).

NOAA COMMISSIONED OFFICERS: NOAA Corps Officers may use a PRT test that has been conducted to satisfy NOAA Corps Regulations to meet the requirements of this Safety Bulletin, provided that the calendar year requirement above is met. The UDS may still require that the PRT be performed if the officer’s physical condition becomes suspect.

PROCEDURE

The PRT will be scheduled by the UDS, guided by the following requirements:

- (1) The operational requirements of the units must be accommodated as much as possible.

- (2) All participants in the PRT will have a current, “approved for diving” diving physical examination on file with the diving unit before taking the PRT.
- (3) The diver will be screened for percent body fat before participating in the PRT.
- (4) Any diver medically unfit to participate in the PRT must also be considered medically unfit to dive. Temporary medical conditions precluding participation should be documented, and the PRT for the individual rescheduled for such a time as the condition has resolved and the individual is ready to return to diving.
- (5) Two CPR certified personnel must be present during the PRT. Medical oxygen must also be available.
- (6) A qualified lifeguard must be present during the 500 yard swim.
- (7) Divers must adequately warm up before the PRT, and cool down slowly after the PRT.
- (8) PRT events should be completed on the same day in the following sequence: sit-reach, sit-ups, push-ups, and 1.5 mile run/walk (or 500 yard swim).

Specific instructions for each exercise are included in attachment 3. The results of the PRT will be reported on the PRT Program Individual Score Sheet (attachment 4).

October 11, 1989

NOAA Diving Safety Bulletin 89-2

MEMORANDUM FOR: All NOAA Divers

FROM: Cliff Newell
Deputy NOAA Diving Coordinator

SUBJECT: Dacor Regulator Recall

We have recently learned that Dacor Corporation issued a recall notice to their dealers in January 89.

Discussion with Dacor personnel indicates that failure of the second stage lever causes a stoppage of air flow to the diver. Please review the attached Dacor report to ensure that you are not using a suspect unit.

May 24, 1990

NOAA DIVING SAFETY BULLETINS

MEMORANDUM FOR: All NOAA Divers

FROM: J. Morgan Wells, NOAA Diving Coordinator

SUBJECT: #90-1; Incident Reporting
#90-2 Field Treatment of Suspected DCS
#90-3 Trendelenburg Position

NOAA DIVING SAFETY BULLETIN #90-1

INCIDENT REPORTING

1. Diving incidents involving equipment malfunctions, diving emergencies, questionable decompression sickness, etc., must be reported immediately via telephone to the NOAA Diving Coordinator (804/878-4092) or the Deputy Diving Coordinator (206/526-6196 or FTS 392-6196).
2. Report Routing Schedule:
 - a. Divemaster; Report immediately to Unit Diving Supervisor (UDS) and submit written report within 7 days to the UDS.
 - b. Unit Diving Supervisor; Report immediately to Line Office Diving Officer (LODO) and submit written report within 10 days to the LODO.
 - c. Line Office Diving Officer; Report immediately to the NOAA Diving Coordinator and submit written report within 30 days to the NOAA Diving Coordinator.

24 MAY 1990

NOAA DIVING SAFETY BULLETIN #90-2

FIELD TREATMENT OF SUSPECTED DECOMPRESSION SICKNESS

1. Field treatment of suspected or mild decompression sickness (oxygen administration only) must be followed by an evaluation by a physician.

Diving is unauthorized until the evaluation has been completed and reported.

2. Report Routing/Schedule:

- a. Divemaster; Report immediately to Unit Diving Supervisor (UDS) and submit written report within 7 days to the UDS.
- b. Unit Diving Supervisor; Report immediately to Line Office Diving Officer (LODO) and submit written report within 10 days to LODO.
- c. Line Office Diving Officer; Report immediately to the NOAA Diving Coordinator and submit written report within 30 days to the NOAA Diving Coordinator.

24 MAY 1990

NOAA DIVING SAFETY BULLETIN #90-3

TRENDELENBURG POSITION

1. Trendelenburg position is no longer recommended for treatment/management of diving accidents.

Physicians affiliated with NOAA Diving Program and other major medical institutions have stated that the Trendelenburg position (head down, body elevated) is of questionable benefit or necessity.

2. Emergency treatment of patients with arterial gas embolism (AGE) includes:
 - a. Maintenance of airway, breathing and circulation.
 - b. Placement of the patient flat with left or right side down in order to minimize the possibility of aspiration in the event of regurgitation.
 - c. Administration of 100% oxygen.
 - d. Rapid evacuation to recompression chamber facility.

These measures form the basis for the emergency treatment of AGE. Head-down position is of uncertain benefit at the present time. It should only be used in a patient with impaired consciousness if the first two measures have been instituted. The patient should not be left in the head-down position for longer than twenty (20) minutes. Placement of the patient in the head-down position should not interfere with rapid evacuation.

Head-down position is of questionable therapeutic benefit in the emergency treatment of decompression sickness. If the patient is awake and alert, or if the symptoms are delayed more than ten minutes after surfacing from the dive, or if there is any difficulty in maintaining a clear airway (i.e., the patient is not breathing or breathing poorly), then the head-down position should not be used.

October 5, 1990

NOAA DIVING SAFETY BULLETIN #90-4

MEMORANDUM FOR: All NOAA Divers

FROM: J. Morgan Wells
NOAA Diving Coordinator

SUBJECT: U.S. Divers Regulator failure

The U.S. Navy Experimental Dive Unit (EDU) has issued an advisory about U.S. Divers (USD) SE-2 series SCUBA regulators 1st stage failures. The potential exist for like failures on all Conshelf series and Royal SL/PRO-Diver series SCUBA regulators.

The failure manifest as a creeping of the intermediate pressure which causes a blow-by of H.P. air (free flow) through the regulator second stage. The failed part is identified as USD part #1053-20- high pressure seat, (see diagram).

Faulty seats can be identified as follows:

1. Product date on packaging has a batch date prior to Aug 22, 1990. Batch dates are read from right to left , (example; April 13, 1990 would be 093140).
2. Visual inspection will reveal well defined outline of black seating material on face of seat. Back of seat may have etched check mark.

Known good seats can be identified as follows:

1. Product date on packaging has a batch date of Aug 22, 1990 or later.

2. Visual inspection will reveal a definite black seating material on face of seat, two etched check marks on back of seat, and/or date etched on back of seat.

Any Divers using USD Conshelf series, SE-2 series or Royal SL/Pro Diver series regulators are to curtail their use until the faulty part can be replaced and regulator tested. Regulators will be inspected and serviced by local vendors, using the information contained in this bulletin.

For any additional information call the NOAA Diving Center at 206 526-6196 or FTS 392-6196.

October 16, 1990

NOAA DIVING SAFETY BULLETIN #90-5

MEMORANDUM FOR: All NOAA Divers

FROM: J. Morgan Wells
NOAA Diving Coordinator

SUBJECT: Scubapro Air II system failures

Scubapro has issued an advisory on Air II regulator/inflator system failures. The failure occurs in the auto inflator and causes the vest to inflate without warning.

The defective part is a sealing seat on the auto inflator mechanism (part #21-626-004 see diagram). Faulty seals can be identified by an orange rubber material on the seat.

Any divers using Air II systems are to curtail their use until the faulty part can be replaced. Scubapro recognizes the problem but will not issue a recall on Air II systems. Scubapro dealers will replace the part on request for no charge.

For any additional information call the NOAA Diving Center at 206 526-6196 or FTS 392-6196.

December 5, 1990

NOAA DIVING SAFETY BULLETIN #90-6

MEMORANDUM FOR: All NOAA Divers

FROM: J. Morgan Wells,
NOAA Diving Coordinator

SUBJECT: U.S. Divers Regulator Failure Update

REFERENCE: NOAA Diving Safety Bulletin #90-4

U.S. Divers has voluntarily decided to extend the field recall involving suspect high pressure seats (part number 1053-20) to include all seats in use in U.S. Divers regulators manufactured or serviced between **July 1, 1988** and **August 15, 1989**. These seats also have the potential of delaminating under pressure and producing a free flow that may make it difficult or impossible for the diver to breathe off the second stage. The recall now covers regulators manufactured from **July 1, 1988** to **August 25, 1990**, or serviced from **July 1, 1988** to the present.

The criteria for identifying suspect seats has been changed. All seats with a single check mark or without any marks on the stem side must be replaced. The only seats that can be used are marked with double check marks or engraved five digit date codes on the stem side.

Regulators that have been inspected since the initiation of the recall on **October 5, 1990** may still contain high pressure seats without any marks on the stem side. These seats are now considered suspect and must be replaced.

Use of U.S. Divers' Conshelf series, SE-2 series, or Royal SI/Pro Diver series regulators must be discontinued until inspection and/or necessary repairs are completed by a U.S. Divers Pro Line repair facility.

For any additional information call the NOAA Diving Center at 206 526-6196 or FTS 392-6196

April 12, 1991

NOAA DIVING SAFETY BULLETIN #91-01

MEMORANDUM FOR: All NOAA Divers

FROM: J. Morgan Wells
NOAA Diving Coordinator

SUBJECT: Bauer Compressed Air Moisture Separator; Model
#061080-410 Safety Recall

Bauer Compressor Inc. has announced a potential problem with Final Separator Housing, Model 061080-410, and a voluntary recall for exchange of the unit.

Subject separator housing can be identified by a data plate attached to it. Housing may be mounted on a compressor or wall mounted Bauer Purification System.

Contact Lisa Mears, Bauer Compressor, 1326 Azelea Garden Road, Norfolk, VA 23502 (804) 855-6006 for further information or to initiate no cost exchange.

May 15, 1991

NOAA DIVING SAFETY BULLETIN #91-02

MEMORANDUM FOR: All NOAA Divers

FROM: J. Morgan Wells
NOAA Diving Coordinator

SUBJECT: Correction to NOAA Diving Program Regulations;
Administrative Order 209-123, issued April 12, 1991

Chest X-Ray Requirements

Based on the recommendations of the NOAA Diving Medical Review Board (NDMRB), NOAA A.O. 209-123, Exhibit 2 shall be revised as follows:

46. Chest X-Ray - Since pressure related effects are mediated through the respiratory system, and lethal consequences may ensue, a report of a 14 x 17 inch chest x-ray, PA and lateral, shall be taken:
1. As a baseline on the initial physical examination.
 2. Every 2 years after the age of 40.
 3. Whenever indicated by medical history or clinical findings.

This change, originally issued as NDSB #86-3, eliminated the requirement for a semi-annual chest x-ray before the age of 40 and reduced the post age 40 chest x-ray requirement from annual to biennially.

Chest x-rays may still be required by an examining physician NDMRB whenever indicated by medical history or clinical findings.

October 9, 1991

NOAA DIVING SAFETY BULLETIN #91-03

MEMORANDUM FOR: All NOAA Divers

FROM: J. Morgan Wells
NOAA Diving Coordinator

SUBJECT: Medications and Diving

The following information was released by the Naval Safety Center, Norfolk VA, 28 September 1991. It is forwarded for your information by the NOAA Diving Center, Seattle WA.

1. There are no drugs or medications considered absolutely safe while diving. Any drug which influences the conscious state of the diver may also affect the susceptibility to nitrogen narcosis and oxygen toxicity. Whereas other medications may complicate the diagnosis or assessment of diving disorders.
2. There are numerous unpredictable effects of medications on the body due to age, sex, weight, cold, fatigue, anxiety, and possible sensitivity to them.

A. Drugs that may be taken without undue risk while diving:

- (1) Aspirin/tylenol/motrin
- (2) Pseudoephedrine, e.g. sudafed
- (3) Antibiotics: appear safe under pressure in most cases. The underlying condition for which the antibiotic is taken could preclude diving. e.g. bronchitis or pneumonia.
- (4) Birth control pills if the individual knows the risks and potential/theoretical risk. Cleared by DMO.
- (5) Thyroid medications: Once cleared by the DMO.
- (6) Diuretics: For mild blood pressure elevation. Cleared by DMO.
- (7) Vitamins: As a daily supplement.

B. As a general rule, any prescription or non-prescription drug other than those on the above list, preclude diving without an approval by a Diving Medical Officer. Specifically, drugs that will not be taken while diving include:

- (1) Antidiarrheal: e.g Lomotil, paregoric, etc. should not be used because of narcotic content.
- (2) Stimulants: May cause dizziness, excessive sweating, euphoria, anxiety and panic at depths as shallow as 50 fsw.
- (3) Alcohol: Often found in cough medicine.
- (4) Heart medications: Digitalis and anti-arrhythmia drugs will not be used. Underlying conditions preclude diving.
- (5) Insulin and oral hypoglycemics: Diabetics should not dive.
- (6) Drug dependence: Any active use of addicting drugs is a contraindication to diving.
- (7) Antihistamines: (Anti-allergy and anti-motion sickness). They may act as a depressant. They are used for seasickness and have side effects of drowsiness. They generally should not be used prior to diving. Especially where nitrogen narcosis may occur.

3. Upon completion of the prescription drug usage, medical clearance by a Diving Medical Officer is required before diving status can be resumed.

4. This message has been coordinated with the office of CNO, BUMED.

NOAA divers can obtain additional information about specific medications by contacting NDC. We will direct all inquiries through the NOAA DMO.

April 14, 1992

NOAA DIVING SAFETY BULLETIN #92-01

MEMORANDUM FOR: All NOAA Divers

FROM: J. Morgan Wells
NOAA Diving Coordinator

SUBJECT: Bauer Utilus-G Compressor Moisture Separator

Bauer Compressor, Inc. has identified an equipment hazard due to metal fatigue of the moisture separator P/N 061423-430 on the subject compressors. A review conducted by Bauer of ten year old compressors revealed that the final moisture separators may have reached the end of their useful life and may be subject to metal fatigue and failure if operated above the prescribed pressure.

Bauer has agreed to replace the part at no cost. Contact Bauer at 804-855-6006. Provide Bauer with the serial number of the compressor and the moisture separator.

For further information contact the NOAA Diving Center at 206-526-6196 or FTS 392-6196.

April 14, 1992

NOAA DIVING SAFETY BULLETIN #92-02

MEMORANDUM FOR: All Divers

FROM: J. Morgan Wells
NOAA Diving Coordinator

SUBJECT: Luxfer Aluminum Scuba Cylinders

Luxfer U.S.A. has identified a potential pinhole leaks in their aluminum scuba cylinders made in the years 1982 and 1983. Repeated filling of bottle with a shoulder/neck leak may lead to catastrophic failure of the cylinder.

The following procedures are provided for identifying pinhole leaks in the shoulder/neck area of aluminum cylinders:

At 50% service pressure and at full service pressure check for bubbles around the cylinder valve, safety disc, and the shoulder/neck area. Use a solution of liquid dish soap and water sponged around these areas.

If a leak is detected around the valve, have the O-ring changed by a certified tank inspector (VCI). If a leak is determined to be coming from the cylinder, bleed the tank down and contact Luxfer at 714-684-5110.

April 29, 1992

NOAA DIVING SAFETY BULLETIN #92-03

MEMORANDUM FOR: All NOAA Divers

FROM: J. Morgan Wells
NOAA Diving Coordinator

SUBJECT: U.S.Divers Regulator Breakdown

Sources have reported finding stress fractures on US Divers Conshelf SE2 (P/N 1074-00). The plastic polymer which forms the second stage body has exhibited cracking. The problem is believed to be related to thermal stress which becomes apparent after 25-30 hours of use with the regulator exposed alternately to warm and cold temperatures. Any units presently using the SE2, Conshelf 21 series, or the Pro-Diver series should have the regulators inspected by an authorized technician.

The NOAA Diving Center will provide SEP regulators to all active/authorized NOAA divers. For further information contact the NOAA Diving Center at 206-526-6196.

November 2, 1992

NOAA DIVING SAFETY BULLETIN #92-04

MEMORANDUM FOR: All NOAA Divers

FROM: J. Morgan Wells
NOAA Diving Coordinator

SUBJECT: Self-inflation of Scubapro BC

It has been brought to our attention that a number of power inflators on Scubapro BC's have allowed self-inflation due to failed seats. In the reported cases, the rate of inflation has varied from slow to complete seat failure. These problems have occurred on Scubapro's quick release balanced power inflator, part number 21-626-000.

Scubapro has not acknowledged any inherent problems with these inflators and is not issuing a recall at this time. However Scubapro does recommend annual service to their inflator. This would include replacing the seat, stem o-ring and the spring. Although these jackets are not part of SEP, the number of reported problems has warranted this bulletin. The NOAA Dive Program recommends you use only SEP issue diving gear. If you have any questions regarding this safety bulletin or your dive gear please contact the NOAA Diving Center at 206-526-6196.

October 5, 1993

NOAA DIVING SAFETY BULLETIN #93-01

MEMORANDUM FOR: All NOAA Divers

FROM: J. Morgan Wells
NOAA Diving Coordinator

SUBJECT: Scubapro MK 15 First Stage Regulators

The following safety notice was recently issued to all Scubapro dealers. The MK 15 first stage regulator **HAS NOT** been issued by the Standardized Equipment Program. This bulletin is only issued for your information.

November 22, 1993

NOAA DIVING SAFETY BULLETIN #93-02

MEMORANDUM FOR: All NOAA Divers

FROM: J. Morgan Wells
NOAA Diving Coordinator

SUBJECT: Changes to U.S. Navy Dive Tables

U.S. Navy Diving Manual, Volume 1, (air diving), 0927-LP-001-9010 revision 3, 15 February 1993 includes the following changes.

1. Ascent Rate: During air dives always ascend at a rate of 30fpm. Minor variations in the rate of travel between 20 and 40 fsw/minute are acceptable. Any variation in the rate of ascent must be corrected in accordance with the procedures in paragraph 7-4.2 of the Diving Manual (attached). However a delay of up to one minute in reaching the first decompression stop can be ignored. (Note: 30 fpm rate also applies to no/decompression diving).
2. Surface Interval: Time increased between repetitive group at the beginning of the surface interval and new group designation as follows;
 - a. In repetitive group B change 2:10 to 3:20 and 2:11 to 3:21
 - b. In repetitive group C change 2:45 to 4:49 and 2:50 to 4:50
 - c. In repetitive group E change 3:22 to 3:24, 3:23 to 3:25, 6:32 to 6:34, and 6:33 to 6:35
 - d. In repetitive group J change 8:40 to 8:50 and 8:41 to 8:51

All NOAA divers should modify tables and procedures currently in use to reflect the above changes.

Attachments

March 1, 1995

NOAA DIVING SAFETY BULLETIN #95-01

MEMORANDUM FOR: All Unit Diving Supervisors and NOAA Visual
Cylinder Inspectors

FROM: Cliff Newell
Chief, NOAA Diving Operations

SUBJECT: SURVIVAIR Technical Bulletin #19,
February 19, 1991

Attached bulletin was recently received from SURVIVAIR following inquiry from a NOAA cylinder inspector.

SURVIVAIR recommends removal and replacement of the nylon dip tube previously used on SCBA assemblies. Replacement aluminum dip tubes can be procured from local vendors, located by calling 800/821-7236.

Prior to receiving new tubes, nylon tube should be removed leaving a blank port. Upon receipt of aluminum dip tubes they should be installed "press to fit".

For further information regarding this subject contact Steve Urick at 206/526-6223.

February 2, 1996

NOAA DIVING SAFETY BULLETIN #96-01

MEMORANDUM FOR: All NOAA Divers

FROM: Cliff Newell
Director, NOAA Diving Program

SUBJECT: Recall of Trelleborg Viking Inc. Sport Dry Suit
Air Inlet Hose Assemblies

Trelleborg Viking Inc., announced a recall of all Viking Sport dry suit air inlet hose assemblies purchased between 1981 and 1988. The cause of the recall is the possibility that a faulty brass spring could have been installed in 500 hose assemblies sold world-wide. While there have been no reported failures of the hose assembly, the manufacturer after recent litigation has requested a recall to maximize safety.

The recall involves only the air hose assemblies used on the Viking Sport dry suit (and does not involve the Pro or Military versions). The Viking-Pro version is issued by the NOAA SEP.

The Viking Sport style assembly consists of a square block with female connector, with T sport style assembly consists of a square block with female connector, with the inflation hose having a male connector. The valve functions by pushing the end of the block to inflate the suit. The Sport air hose assembly can be distinguished from the pro valve in the following way: the pro valve is a round valve with a male silver connector protruding from the side of the valve. The inflating hose connects to this connector by a female quick disconnect. Additionally, the pro valve is operated by pushing the top of the valve, vice pushing the end of the Sport valve.

Take the following action to comply with the recall:

- a. Determine if your command carries any Viking Sport dry suits or sport style valve assemblies.
- b. If Sport style valve assemblies are found, check for a code on the flattened hex nut of the sport inflation hose (the first stage end). If there is no code or a code beginning with an A, B or C is found, then the valve assembly is subject to the recall.
- c. If valve assemblies are found which are subject to the recall, do not use the dry suit, and call either Mr. John Drewniak, Trelleborg Viking, (800) 344-4458, or the NOAA Diving Center point of contact.

For further information regarding this subject contact the NOAA Diving Center at 206/526-6196.

July 22, 1996

NOAA DIVING SAFETY BULLETIN #96-02

MEMORANDUM FOR: All NOAA Divers

FROM: Cliff Newell
Director, NOAA Diving Program

SUBJECT: Oceanic Submersible Pressure Gauge: "Air-Spool
Failure

The NOAA Diving Center (NDC) and Oceanic have identified the cause of failure between the high pressure hose and the submersible pressure gauge. The failure is related to the hose swivel fitting and not the performance of the gauge itself. Hoses not manufactured to specifications permit excessive "wobble" between the gauge body and the air-spool connection at the hose end.

Unintended lateral force placed on the console between the hose connection and the console body results in the air-spool "snapping" into two pieces at the lower O-ring. The problem is identified by catastrophic failure of the air-spool located inside the connection between the HP hose and the gauge body. Failure results in excessive air leaking from around the base of the console boot.

The attached diagram (Fig. 1) shows the area of concern and provides you with the factory specified measurements that can be checked to determine if the hose crimp is within tolerance.

Remove the gauge from the console boot and check the areas indicated below for proper tolerance. If the unit is out of specification, or if you are unsure, but believe that a "significant" amount of wobble exists to warrant concern, notify NDC as soon as possible and we will ship a replacement immediately.

August 13, 1998

NOAA DIVING SAFETY BULLETIN #98-01

MEMORANDUM FOR: All NOAA Divers

FROM: David A. Dinsmore
Director, NOAA Diving Program

SUBJECT: Physical Examination Frequency

Effective this date, the frequency requirement for NOAA diving physical examinations is changed from annual to the following intervals based on age:

Up to Age thirty five (35) - Once every three (3) years

Age thirty five (35) to fifty (50) - Once every two (2) years

Age fifty (50) and above - Annually

Physical requirement are unchanged and must be completed on the newest versions of the SF-88, Report of Medical Examination and SF-93, Report of Medical History.

Upon receipt of the completed medical documents/results from examining physicians, divers are responsible for distribution of these forms to the NOAA Diving Center through the Unit Diving Supervisors. Original forms shall be retained by individuals for personal records or to provide additional copies.

If you have any questions regarding this change, contact LCDR Frank Wood at (206) 526-6196.

October 7, 1999

NOAA DIVING SAFETY BULLETIN #99-01

MEMORANDUM FOR: All NOAA Divers

FROM: David A. Dinsmore
Director, NOAA Diving Program

Subject: New policy concerning inspection and replacement of Luxfer scuba cylinders

Effective immediately, Luxfer requires that every Luxfer scuba cylinder 15 years old or older be visually inspected annually by a properly trained inspector, as well as inspected with Visual Plus or equivalent non-destructive testing equipment. If the cylinder passes the inspection, it will be certified for use by the inspector. Cylinders that are not inspected and not certified should not be used. Cylinders that fail the inspection should be removed from service.

This Luxfer-required inspection is in addition to periodic hydrostatic retesting mandated by the U.S. Department of Transportation (every five years.) NOAA requires that cylinders be visually inspected at least once each year by a properly trained inspector. For cylinders in heavy use (for example, those being filled several times a day), Luxfer recommends visual inspection every four months.

If a properly inspected scuba cylinder is found to have either a manufacturing defect or sustained-load cracking, Luxfer will honor the following replacement policy:

- If the cylinder is 10 years old or less (based on the original hydrotest date), Luxfer will replace the cylinder at no charge. Luxfer will not replace cylinders that have been damaged in normal use or due to abuse or mistreatment.
- If the cylinder is more than 10 years old, the customer may purchase an equivalent replacement cylinder for US\$50 for cylinders manufactured in the United States. For Luxfer aluminum cylinders manufactured elsewhere, the purchase price will be determined in the country of origin based on local currency rates.

A manufacturing defect[®] is any imperfection that fails to meet product specifications at the time of manufacture.

The new policy applies only to Luxfer scuba cylinders, not to Luxfer cylinders used in other applications.

Although Luxfer helped develop Visual Plus inspection technology, they are not affiliated with Visual Plus and do not derive profits from the sale of Visual Plus units.

For more information about the new scuba policy or Luxfer scuba products, please contact Luxfer Gas Cylinders, 3016 Kansas Avenue, Riverside, Calif. 92507 USA; telephone 909-684-5110, fax 909-781-6598.

October 01, 2001

NOAA DIVING SAFETY BULLETIN #02-01

MEMORANDUM FOR: All NOAA Divers

FROM: David A. Dinsmore
Director, NOAA Diving Program

Subject: Diving Physical Examination Changes

Effective this date, the following changes to NOAA diving physical requirements have been made:

Dive Physical Frequency:

Unless otherwise specified:

- To age forty-nine (49) - Every five (5) years
- Age fifty (50) to fifty-nine (59) - Every two (2) years
- Age sixty (60) and older - Annually

Physical Examination Changes

Initial Examination - All Ages, require the following:

Medical History	Complete Physical Examination	Chest X-ray
Spirometry	Hematocrit or Hemoglobin Results	Urinalysis
Vision	Body Composition Analysis (body fat)	Other testing as required

Periodic Re-examination - All Ages, require the following:

Medical History	Complete Physical Examination	Hematocrit or Hemoglobin
Urinalysis	Vision	Body Composition Analysis
Other testing as required		

Age 40 and Older, include with the above examinations:

Lipid Screening

12-Lead Resting EKG

Glucose Screening

Annual Medical History Form

All divers under the age of sixty (60) must complete and submit NOAA form 56-59, NOAA Diving - Annual Medical History Report, to the NOAA Diving Center by March 1st of each year. This form must be signed by the diver, but does not require a physicians signature. Failure to submit this form prior to March 1st may result in suspension of NOAA diving certification.

Dive Physical Forms

All diving physicals must include:

NOAA form 56-57, NOAA Diving Program - Medical Evaluation Checklist

Medical History form

Medical Examination form

Body Composition Screening form

All Wage Marines and NOAA Corps Officers must continue to use Standard Forms 88 (Report of Medical Examination) and 93 (Report of Medical History). All other NOAA and non-NOAA divers may substitute NOAA forms 56-58 (NOAA Diving Medical History Report) and 56-60 (NOAA Diving Medical Evaluation Report).